

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARCO M. MONTI
and DOMENICO ROSSI

Appeal No. 95-3917
Application 07/861,144¹

ON BRIEF

Before HAIRSTON, KRASS, and BARRETT, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

¹ Application for patent filed March 31, 1992, entitled "Integrated Circuit With Trimmable Passive Components," which claims the priority benefit under 35 U.S.C. § 119 of Italian Application MI91 A 001187, filed April 30, 1991.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1-22, all of the claims pending in the application. The amendment filed with the appeal brief as Appendix B has not been entered (Examiner's Answer, page 1).

The invention is directed to an integrated circuit which includes a network of passive elements (e.g., resistors or capacitors) that can be selectively connected to one another between first and second nodes of the network in either a parallel or series arrangement. A plurality of logic gates controlled by a decoder are used to selectively include or exclude each passive element from contributing to the value of the passive component represented by the equivalent circuit of the network between the first and second nodes.

Claim 1 is reproduced below.

1. An integrated circuit having a trimmable passive circuit component adjustable to achieve a precise target value, comprising:

a decoder having N inputs and M outputs, wherein M is related to and exceeds N, said inputs and outputs each having first and second logic states, the logic states of the outputs corresponding to coded logic states on the inputs; and

a network connected to the outputs of the decoder and having a first node and a second node defining the terminals of the passive circuit component within the integrated circuit, the network including a plurality of interconnected passive elements and a plurality of corresponding logic gates, each logic gate having a control terminal for setting the logic gate to either a conductive state or a nonconductive state, each control terminal being coupled to and controlled by one of the M outputs of the decoder, each gate being connected to its corresponding passive element for selectively including or excluding the passive element from a circuit path between the first and

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second nodes so as to selectively contribute to the value of the passive circuit component according to the coded logic states on the N inputs.

The examiner relies on the following references:

Merrick	4,546,651	October 15, 1985
Hochschild	4,855,685	August 8, 1989
Kalaf	5,164,620	November 17, 1992 (filed November 26, 1991)

Claims 1-22 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regards as their invention.

Claims 1-4, 6, 8, 11-12, 14, 17-18, and 20-21 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Merrick.

Claim 5 stands rejected under 35 U.S.C. § 103 as being unpatentable over Hochschild and Merrick.

Claims 1, 7, 8, 13, 14, 19, 20, and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Kalaf.

OPINION

We affirm-in-part.

Objection to the drawings

The objection to the drawings is an "objection" under 35 U.S.C. § 132, which the Board has no jurisdiction to review. Such matters are reviewable by petition to the Commissioner. The Board's

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jurisdiction is limited to those matters involving the rejection of claims. In re Hengehold, 440 F.2d 1395, 1404, 169 USPQ 473, 480 (CCPA 1971). Nevertheless, the examiner should seriously consider withdrawing the objection for the reasons stated with respect to the rejection of the claims under 35 U.S.C. § 112, second paragraph.

Grouping of claims

The examiner states (Examiner's Answer, page 2):

The brief includes a statement that claims 1-22 do not stand or fall together. While the argument section does provide specific groupings, such groupings have not been argued separately as required. Therefore, these claims are presumed to stand or fall together.

Appellants do not contest this statement in the reply brief and, accordingly, we consider the dependent claims to stand or fall together with the independent claims on which they depend. Appellants list separate groups of claims (Brief, pages 20-21), but make no attempt to point out the inapplicability of the references. Cf. In re Beaver, 893 F.2d 329, 330, 13 USPQ2d 1409, 1410 (Fed. Cir. 1989) ("Although concise, the arguments pointed out the essential elements as compared with prior claims, and the inapplicability of the cited references, which had previously been discussed in the brief."). It is not our function to make appellants' arguments for them.

35 U.S.C. § 112, second paragraph

The examiner states (Examiner's Answer, page 3):

In claim 1, line 1 recites that the circuit has "a trimmable passive circuit component", while line 8 recites a "network" that defines "the terminals of the passive circuit component". It is not understood how this is possible. Line 1 clearly claims a "passive circuit component", which would be understood to be a distinct element. It is not seen how a "network" can define "the terminals" of another distinct element. Also, the term "network" only describes the arrangement of circuit elements. However, just claiming "a network" does not set forth any elements within the claimed "integrated circuit".

The examiner appreciates that "clearly the 'network' is the 'passive circuit component'" (Final Rejection, page 2). Since it is clear to the examiner, and clear to us, that the "network" is the "passive circuit component" and that "a first node and a second node defining the terminals of the passive circuit component" in claim 1 refer to the terminals of the network, not another distinct element, the claim is not indefinite for this reason. Similar rationale by the examiner with respect to claims 8 and 14 is also nonpersuasive: it is clearly the "network" that is being adjusted to a target value.

As to the claims not setting forth any elements within the "integrated circuit," this does not make the claim indefinite, since the claim is directed to only the details of the passive circuit component. The examiner must have seen many claims of this form; e.g., "a television receiver having an oscillator circuit comprising . . .," where the claim just recites the details of the oscillator circuit. The "integrated circuit" sets the generic environment for the passive circuit component; for this reason, the examiner should also seriously consider withdrawing the objection to the drawings.

We have considered the examiner's reasons with respect to claim 20, but are not convinced that there is any problem which renders the claim indefinite. The preamble statement that the method is "for trimming" is not mutually exclusive with the body of the claim starting out with fabrication of an integrated

circuit chip, since the method is detailed later in the claim. The step of "providing coded input signals . . . in accordance with said target value and said fabricating process" is described, for example, as progressively increasing the value of resistance until the optimum value of resistance is obtained as part of the fabricating process (e.g., specification, page 7). Nor do we see a problem with the recitation that "each conductive gate includes a corresponding passive element" since this clearly means that a gate, say G8 in figure 1, has a corresponding passive element, R8 in figure 1; the limitation does not state that the gate is a passive element.

For the reasons discussed above, the rejection of claims 1-22 is reversed.

35 U.S.C. § 102(b)

Figure 3J of Merrick discloses a digitally controlled resistance D_R . "The output of the counter 66 is digital and is applied through a decoder 69 so as to set the resistance of D_R at a desired value. The internal circuit of the digitally controlled resistance D_R is schematically represented by series resistors r_1 , r_2 and r_3 that are respectively shunted by switches s_1 , s_2 and s_3 ; but in actuality, the resistor connections would be much more complicated" (column 18, lines 54-61). "At each count, the coded output of the counter 66 changes, and each output causes different combinations of the switches s_1 , s_2 and s_3 in D_R to open or close, thereby placing the corresponding resistor combination in the attenuator circuit" (column 19, lines 9-13). Thus, Merrick has a decoder and a network (D_R) of a plurality of interconnected passive elements (r_1 , r_2 , and r_3) and a plurality of corresponding logic gates (s_1 , s_2 and s_3).

Appellants argue specifically only that Merrick does not disclose "trimming." Appellants reiterate the limitations of claims 1, 8, 14, and 20 (Brief, pages 12-13), but these arguments are not persuasive because the limitations said to be not shown or suggested appear to be clearly shown. With respect to rejections under 35 U.S.C. § 102, the rule for appeal briefs, 37 CFR § 1.192(c)(6)(iii) (1994), required appellants to identify "specific limitations in the rejected claims which are not described in the prior art relied upon in the rejection." General arguments that the whole claim is not suggested are not persuasive. We address only those differences specifically argued by appellants. Therefore, we do not look for differences beyond those which are discussed in appellants' brief. Cf. In re Baxter Travenol Labs., 952 F.2d 388, 391, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991) ("It is not the function of this court to examine the claims in greater detail than argued by an appellant, looking for nonobvious distinctions over the prior art."); In re Wiseman, 596 F.2d 1019, 1022, 201 USPQ 658, 661 (CCPA 1979) (arguments must first be presented to the Board).

The declaration of Vernon McKenny under 37 CFR § 1.132 submitted with the brief states (Declaration ¶ 5):

In integrated circuit arts, 'trimming' normally refers to precision adjustment of a passive component (normally a resistor or capacitor) to make its value PERMANENTLY equal to a desired target value. Trimming is usually done at the time of manufacturing, and is usually not possible thereafter.

Appellant argues that Merrick acts to dynamically control the resistance through this part of the circuit and "[t]his is NOT the same circuit as the invention and it does NOT act the same as the invention in the overall circuit" (Brief, page 11). McKenny states (Declaration ¶ 12):

Merrick also provides a DYNAMICALLY switched resistor bridge (to restore loop gain to unity after it has been changed). Thus, the changes made in the resistor values would never be permanent. Again, this is not related to trimming, but instead appears to be a variation of automatic gain control.

Appellant concludes that "Merrick does not suggest any relevance to trimming" (Brief, page 11). The reply brief argues that the examiner has chosen to rely on his own definition of "trimming," rather than the definition provided by McKenny, an expert in the art (Reply Brief, page ii).

Claim 14 does not contain the word "trimming" in any form and, accordingly, appellants' arguments are not commensurate in scope with claim 14. The rejection of claim 14 is sustained.

During prosecution before the Patent and Trademark Office, when the claims may be amended, claim language is given its broadest reasonable interpretation, and limitations appearing in the specification are not to be read into the claims. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969); In re Zletz, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); In re Priest, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978) (inferential limitations are not to be read into the claims).

The examiner correctly interpreted that "the term 'trimming' means the [sic, that] a value (in the [sic, this] instance an impedance) is adjusted or varied" (Final Rejection, page 5). As the examiner points out (Examiner's Answer, page 8), this interpretation that "trimming" is "adjusting" is factually consistent with the definition of "trimming" as "[t]he fine adjustment of capacitance, resistance, or inductance in a circuit," Radio Shack Dictionary of Electronics. This definition does not require that the adjustment be permanent,

or that trimming be performed at the time of manufacture, or that the value obtained by trimming be unchanged while the circuit is in operation. Any of these limitations could have been added to the claims by amendment. As the examiner points out (Examiner's Answer, page 9), the values set in appellants' network are not necessarily permanent. We do not doubt that some kinds of trimming involve permanent setting at the time of manufacture as stated in McKenny's declaration. However, neither McKenny nor appellants has shown that the examiner's interpretation of "trimming" is inconsistent with the broad dictionary definition. "Absent an express definition in their specification, the fact that appellants can point to definitions or usages that conform to their interpretation does not make the PTO's definition unreasonable when the PTO can point to other sources that support their interpretation." In re Morris, No. 96-1425 (August 18, 1997), slip op. at 10. In addition, the claim language ("An integrated circuit having a trimmable passive circuit component adjustable to achieve a precise target value" in claims 1 and 8, and "A method for trimming a passive component in an integrated circuit, to achieve a precise target value" in claim 20), suggests that the "trimmable" or "trimming" limitation is met if the limitations in the body of the claim are met, which they are. For these reasons, we sustain the rejection of claims 1-4, 6, 8, 11-12, 14, 17-18, and 20-21.

35 U.S.C. § 103

Hochschild and Merrick

Figure 1 of Hochschild shows an operational amplifier 10 having a feedback resistor network comprising four series-connected resistors 40, 42, 44, and 48 in parallel with series-connected resistors 36, 38 in parallel with resistor 34. The transistors 28, 30, and 32 are connected in series in each of the parallel paths. The examiner concludes that "it would have been obvious to one skilled in the art to use a similar decoder to control each of the Digitally Controlled Resistors in the circuit disclosed to Hochschild for the expected additive result of having less control lines" (Examiner's Answer, page 5). We agree that it would have been obvious to use a digital signal and decoder as taught in Merrick to control the transistors of Hochschild. Equally apparent is that it would have been obvious to use parallel-connected resistors as taught by Hochschild in place of the series-connected resistors in Merrick to achieve the same result of a variable resistance between two points. Moreover, we think that the use of parallel-connected resistors would have been obvious even without a reference since the person of ordinary skill in the art would have known that whatever could be done with series-connected resistors could be done with an equivalent circuit of parallel-connected resistors. Note that Merrick describes that "[t]he internal circuit of the digitally controlled resistance D_R is schematically represented by series resistors r_1 , r_2 and r_3 that are respectively shunted by switches s_1 , s_2 and s_3 ; but in actuality, the resistor connections would be much more complicated" (column 18, lines 57-61).

Appellants' arguments that neither Hochschild nor Merrick suggests any relevance to trimming (Brief, page 15) are not persuasive for the reasons stated in the rejection over Merrick. That is, the definition of trimming is broader than argued by appellants and declarant McKenny and the structure of claim 1 suggests that a passive circuit component is "trimmable" if it satisfies the limitations for being able to selectively include or exclude passive elements from a circuit path.

Appellant argues that the examiner has not shown any motivation for combining Hochschild and Merrick to arrive at the claimed invention (Brief, page 15). The examiner responds that both Hochschild and Merrick are digitally controlled resistors and that it would have been obvious to replace one kind of digitally controlled resistor with another. We agree. Hochschild shows that a parallel-connected arrangement of resistors was known. Merrick states that "[t]he internal circuit of the digitally controlled resistance D_R is schematically represented by series resistors r_1 , r_2 and r_3 that are respectively shunted by switches s_1 , s_2 and s_3 ; but in actuality, the resistor connections would be much more complicated" (column 18, lines 57-61), which plainly suggests that other arrangements of resistors could be used. One of ordinary skill in the art would have been motivated to apply the parallel-connected arrangement in Hochschild as an alternative to Merrick's series-connected arrangement.

Appellant argues (Brief, page 16): "The claimed methods and structures meet long-felt needs in the art of analog integrated circuit design. The duration of long-felt need is shown, for example, by the excerpt from the decade-old Grebene book which is attached as APPENDIX D." The examiner notes that Grebene does not discuss any long-felt needs (Examiner's Answer, page 10). We agree that the fact

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that appellants' circuit is not shown in Grebene's discussion of trimming is not probative of long-felt need.

Long felt need must be for a solution to a real problem which has been recognized in the prior art or in the industry. See generally E.W. Walker, Objective Evidence of Nonobviousness: The Elusive Nexus Requirement (Part II), 69 J. Pat. Off. Soc'y 230, 230-33 (May 1987). Digitally controlled resistors and capacitors were well known in the art as the many references in the record show.

For the reasons stated above, the rejection of dependent claim 5 is sustained.

Kalaf

Figure 1 of Kalaf discloses an autonomous gain normalization circuit. "The output of the input circuit 10 is provided to a transimpedance amplifier 12 which comprises a reset switch 20, a fixed capacitor 22 and a plurality of switchable capacitors 24-30 connectable in parallel with the fixed capacitor 22 via switches 32-38, which preferably comprise transistors" (column 3, lines 39-44). "[C]onnecting the switchable capacitors 24-30 in parallel with the fixed capacitor 22 reduces the gain of the transimpedance amplifier 12 by an amount proportional to the ratio of the switched capacitor 24-30 to the fixed capacitor 22" (column 3, lines 59-63). "The feedback circuit 44 [unnumbered in figure 1] is operative to effect connection of selected capacitors 24-30 in parallel with the fixed capacitor in direct response to the value of the digital output word" (column 4, lines 26-29). Thus, Kalaf has a network of a plurality of interconnected passive elements (capacitors 24-30) and a plurality of corresponding logic gates (switches 32-38) which selectively include or exclude the passive elements. The examiner finds that Kalaf does not specifically disclose that the feedback circuit is a decoder, but concludes that it would have been obvious to use a decoder in view of the language "that various circuits are possible for effecting such switching in direct response to the state of individual bits contained within the digital output word" (column 4, lines 29-32).

Appellants' arguments are limited to the argument that Kalaf does not suggest any relevance to trimming. These arguments are not persuasive for the reasons stated in the rejection over Merrick. Again, appellants' reiteration of the limitations of claims 1, 8, 14, and 20 generally as not being met (Brief,

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pages 17-19) is not persuasive because the limitations said to be not shown or suggested appear to be clearly shown. See 37 CFR § 1.192(c)(6)(iii) (appellants required to identify "specific limitations in the rejected claims which are not described in the prior art relied upon in the rejection"). Accordingly, we sustain the rejection of claims 1, 7, 20, and 22.

We normally address only those differences specifically argued by appellants. Cf. Baxter Travenol Labs., 952 F.2d at 391, 21 USPQ2d at 1285 ("It is not the function of this court to examine the claims in greater detail than argued by an appellant, looking for nonobvious distinctions over the prior art."); Wiseman, 596 F.2d at 1022, 201 USPQ at 661 (arguments must first be presented to the Board). However, since independent claims 8 and 14 clearly require "series-connected passive elements" and since Kalaf shows parallel-connected capacitors and the examiner does not address the obviousness of this difference, we are compelled to reverse the rejection of claims 8, 13-14, and 19.

CONCLUSION

We have reversed the rejection of claims 1-22 under 35 U.S.C. § 112, second paragraph.

We have sustained the § 102(b) rejection of claims 1-4, 6, 8, 11-12, 14, 17-18, and 20-21 over Merrick, the § 103 rejection of claim 5 over Merrick and Hochschild, and the § 103 rejection of claims 1, 7, 20, and 22 over Kalaf.

We have reversed the § 103 rejection of claims 8, 13-14, and 19 over Kalaf.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

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AFFIRMED-IN-PART

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
ERROL A. KRASS)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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